



Startup of Motion Control Card

Agenda

- **Installation & Testing of PCI-1240U**
- **Installation & Testing of PCI-1202U**

Installation & Testing of PCI-1240U

Driver installation

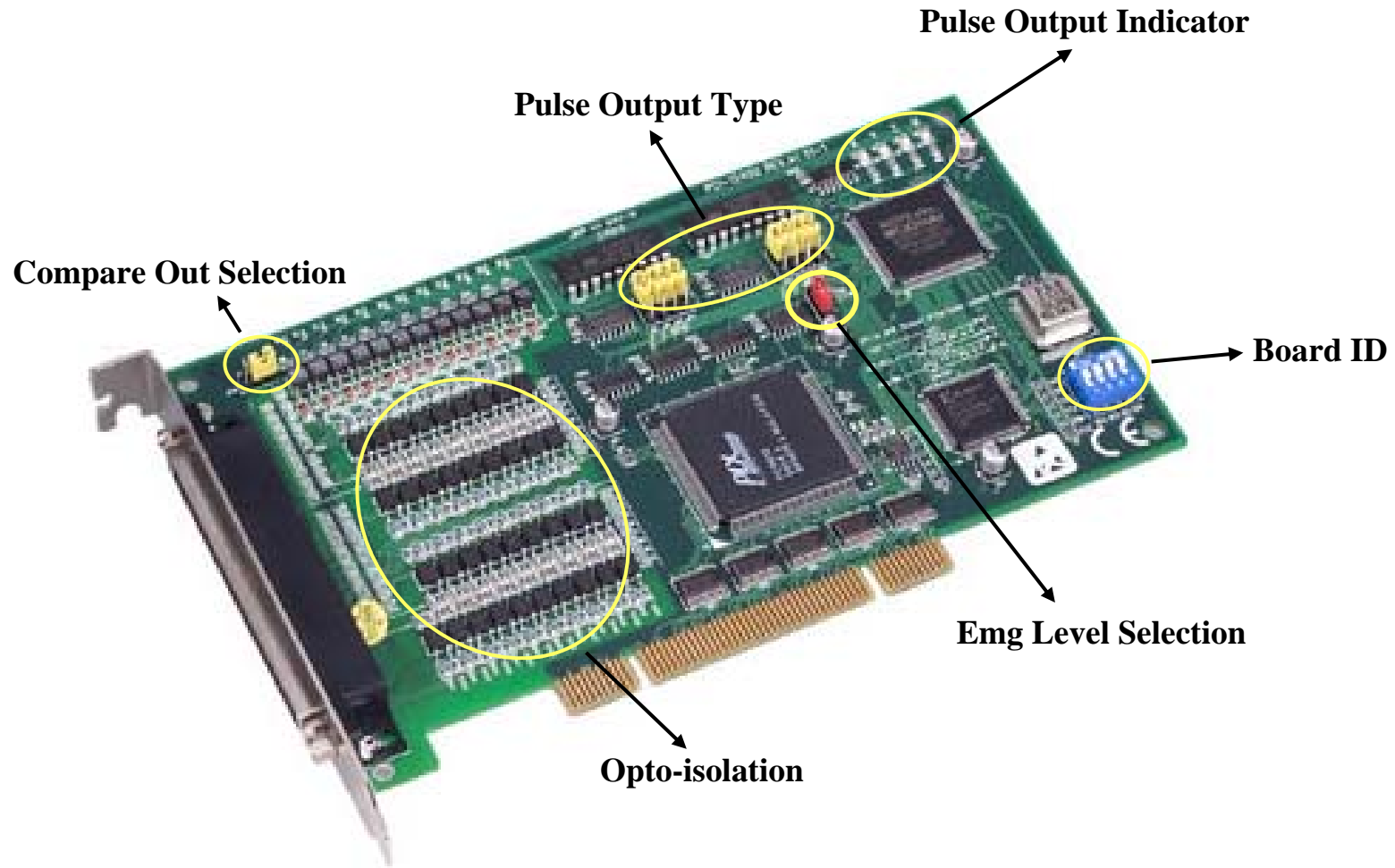
- **Driver:** PCI1240.exe
Source: Companion CD\Drivers\PCI\1240.exe
Website: http://support.advantech.com.tw/support/DownloadSRDetail.aspx?SR_ID=1-C0SSD
- **After the installation, the software manual can be found in** C:\Program Files\Advantech\Motion\PCI-1240\Manual\PCI1240.chm
- **VB, VC, BCB, C#, Delphi, VB.NET examples is given at** C:\Program Files\Advantech\Motion\PCI-1240\Example

Jumper and DIP SW Setting

- **Make sure you have installed the software driver first before you plug in the PCI-1240U.**
- **Adjust the Board ID(DIP SW in blue), EMG(JUMPER in red) & Output Pulse Definition (JUMPER in yellow) according to the motor driver connected.**



Locations of Jumpers and DIP Switches



Signal Connection

- Signals are classified as shown below

Function	Signals	Note
Driving	P+P, P+N, P-P, P-N	
Feedback	ECAP, ECAN, ECBP, ECBN	
Protection	LMT+, LMT-, EMG	
Home	IN3, IN0P, IN0N	IN3=ORG IN0=index
IO	IN1~2, OUT4~7, INPOS, ALARM, EXOP	OUT6=SVON OUT4,5=CMP
Power	GND, VEX	

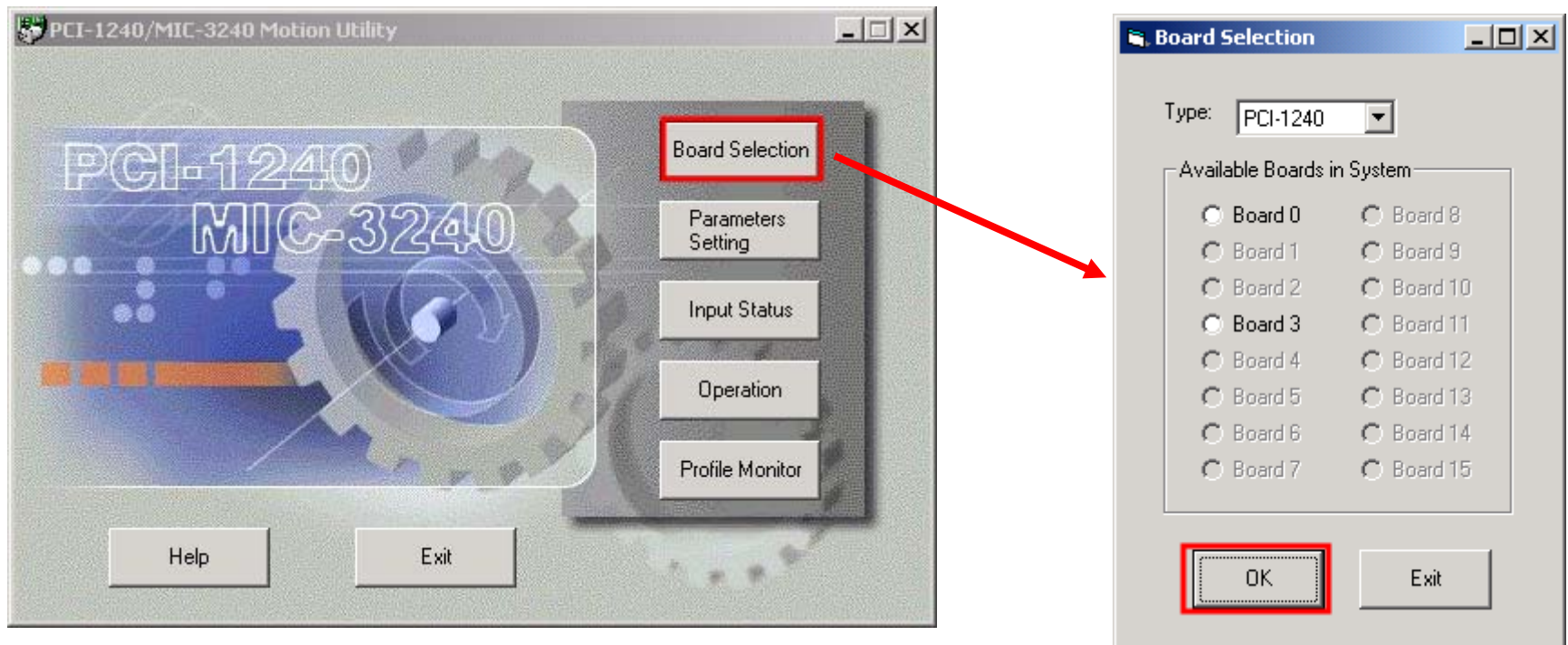
Utility Operation

- Start Manu → Programs → Advantech Automation → Motion → PCI-1240 → PCI-1240 Utility



Utility Operation

- Select BoardID first by “Board Selection” button



Utility Operation

- Set parameters by clicking “Parameter Setting”
Group 1 is for Pulse Output setting

Parameters
Setting

PCI-1240 Motion Utility - Parameters Setting - Board 0

Group 1 | Group 2 | Group 3 | Group 4 | Home Parameter

nP+P/N nP-P/N Pulse Output Mode

- ☒ CW/CCW Pulse Output Mode
- ☐ Pulse/Direction Output Mode

nP+P/N nP-P/N Pulse Output Level

- ☒ Pulse Output Active High
- ☐ Pulse Output Active Low

nP-P/N Direction Output Level

- ☒ Low for CW, High for CCW
- ☐ Low for CCW, High for CW

Acceleration Mode

- ☒ T Curve Mode
- ☐ S Curve Mode

Drive Speed Parameter Range Reference

Multiplier Setting (1 ~ 500) : 1

Drive Speed Range (DV) : 1 ~ 8000

Acceleration Range (AC) : 125 ~ 1000000

Rate of Acc. Range (AK) : 954 ~ 62500000

Drive Speed Parameters Setting

Initial Speed (SV) : 1000 PPS

Drive Speed (DV) : 8000 PPS

Max. Drive Speed (MDV) : 8000 PPS

Acc./Dec. (AC) : 600000 PPS/Sec

Rate of Acceleration (AK) : 10000000 PPS/Sec^2

Display parameters from:

- ☒ Axis X
- ☐ Axis Z
- ☐ Axis Y
- ☐ Axis U

Load

Import

Save Parameters to:

- ☐ Axis X
- ☐ Axis Z
- ☐ Axis Y
- ☐ Axis U

Save

Reset

Export

Exit

Utility Operation

- Set parameters by clicking “Parameter Setting”
Group 2 is for HW Input Signal setting

Parameters
Setting

PCI-1240 Motion Utility - Parameters Setting - Board 0

Group 1 | **Group 2** | Group 3 | Group 4 | Home Parameter

LMT+/LMT- H/W Limited Switch Operation Mode

- ☒ Stop Immediately
- ☐ Slow Down then Stop

Motor Alarm and In Position Input Setting

- ☐ Enable Motor Alarm Input
- ☐ Enable Motor In Position Input

LMT+ Input Active Level

- ☒ Active When Input in Low Level
- ☐ Active When Input in High Level

Motor Alarm Input Level Setting

- ☒ Active Low Level
- ☐ Active High Level

LMT- Input Active Level

- ☒ Active When Input in Low Level
- ☐ Active When Input in High Level

Motor In Position Input Level Setting

- ☒ Active Low Level
- ☐ Active High Level

Display parameters from:

- ☒ Axis X
- ☐ Axis Z
- ☐ Axis Y
- ☐ Axis U

Load

Import

Save Parameters to:

- ☐ Axis X
- ☐ Axis Z
- ☐ Axis Y
- ☐ Axis U

Save

Export

Reset

Exit

Utility Operation

- Set parameters by clicking “Parameter Setting”
Group 3 is for IN and OUT pin setting

Parameters
Setting

The screenshot shows the 'PCI-1240 Motion Utility - Parameters Setting - Board 0' window. The 'Group 3' tab is selected, displaying settings for input and output pins. The settings are organized into two columns.

Left Column Settings:

- IN1 ~ IN2 Limited Switch Function Disable/Enable:**
 - ☒ Enable IN1 Limited Switch Function
 - ☒ Enable IN2 Limited Switch Function
- IN0[Index] Active Level:**
 - ☒ Active When Input in Low Level
 - ☐ Active When Input in High Level
- IN1 Active Level:**
 - ☒ Active When Input in Low Level
 - ☐ Active When Input in High Level

Right Column Settings:

- OUT4 ~ 7 Operation Mode:**
 - ☒ General Purpose Output
 - ☐ Drive Status Indicator
- IN2 Active Level:**
 - ☒ Active When Input in Low Level
 - ☐ Active When Input in High Level
- IN3[Home] Active Level:**
 - ☒ Active When Input in Low Level
 - ☐ Active When Input in High Level

Bottom Section:

Display parameters from:

- ☒ Axis X ☐ Axis Z
- ☐ Axis Y ☐ Axis U

Save Parameters to:

- ☐ Axis X ☐ Axis Z
- ☐ Axis Y ☐ Axis U

Buttons: Load, Import, Save, Reset, Export, Exit.

Utility Operation

- Set parameters by clicking “Parameter Setting”
Group 4 is for Encoder, SW Limit and Compare setting

Parameters
Setting

The screenshot shows the 'PCI-1240 Motion Utility - Parameters Setting - Board 0' window. The 'Group 4' tab is selected, showing settings for Encoder, SW Limit, and Compare. The window is divided into several sections:

- Enable/Disable S/W Limited Switch Function:**
 - ☐ Enable COMP+ Register as S/W Limited Switch
 - ☐ Enable COMP- Register as S/W Limited Switch
- Comp+/- Register Comparing Mode:**
 - ☒ Compare with Logical Position Counter
 - ☐ Compare with Real Position Counter
- Encoder Input Mode:**
 - ☐ CW/CCW Pulse Mode
 - ☒ AB Phase 1/1 Mode
 - ☐ AB Phase 1/2 Mode
 - ☐ AB Phase 1/4 Mode
- Enable/Disable Interrupt:**
 - ☐ Interrupts When P Counter >= Comp- Register
 - ☐ Interrupts When P Counter < Comp- Register
 - ☐ Interrupts When P Counter >= Comp+ Register
 - ☐ Interrupts When P Counter < Comp+ Register
 - ☐ Interrupt is Generated at the Rising Edge of Each Output Pulse
 - ☐ Interrupts When Deceleration Starts in Accelerating/Decelerating Drive
 - ☐ Interrupts When Acceleration Ended in Accelerating/Decelerating Drive
 - ☐ Interrupts When It Finished Driving
- P Counter :** Real or Logical Position Counter
- Display parameters from:**
 - ☒ Axis X ☐ Axis Z
 - ☐ Axis Y ☐ Axis U
- Save Parameters to :**
 - ☐ Axis X ☐ Axis Z
 - ☐ Axis Y ☐ Axis U

Buttons at the bottom include Load, Import, Save, Export, Reset, and Exit.

Utility Operation

- Set parameters by clicking “Parameter Setting”
Home Parameter is for Home setting

Parameters
Setting

PCI-1240 Motion Utility - Parameters Setting - Board 0

Group 1 Group 2 Group 3 Group 4 **Home Parameter**

HomeType:

CW End: CCW End:

Phase0 Setting
Direction: ☐ CW ☒ CCW
Speed:

Phase1 Setting
Direction: ☒ CW ☐ CCW
Speed:

Phase2 Setting
Direction: ☐ CW ☒ CCW

Phase3 Setting
Offset:
Speed:

CCW End Hardware Home (IN3) Logical Home Moving Object CW End

Display parameters from:
☒ Axis X ☐ Axis Z
☐ Axis Y ☐ Axis U

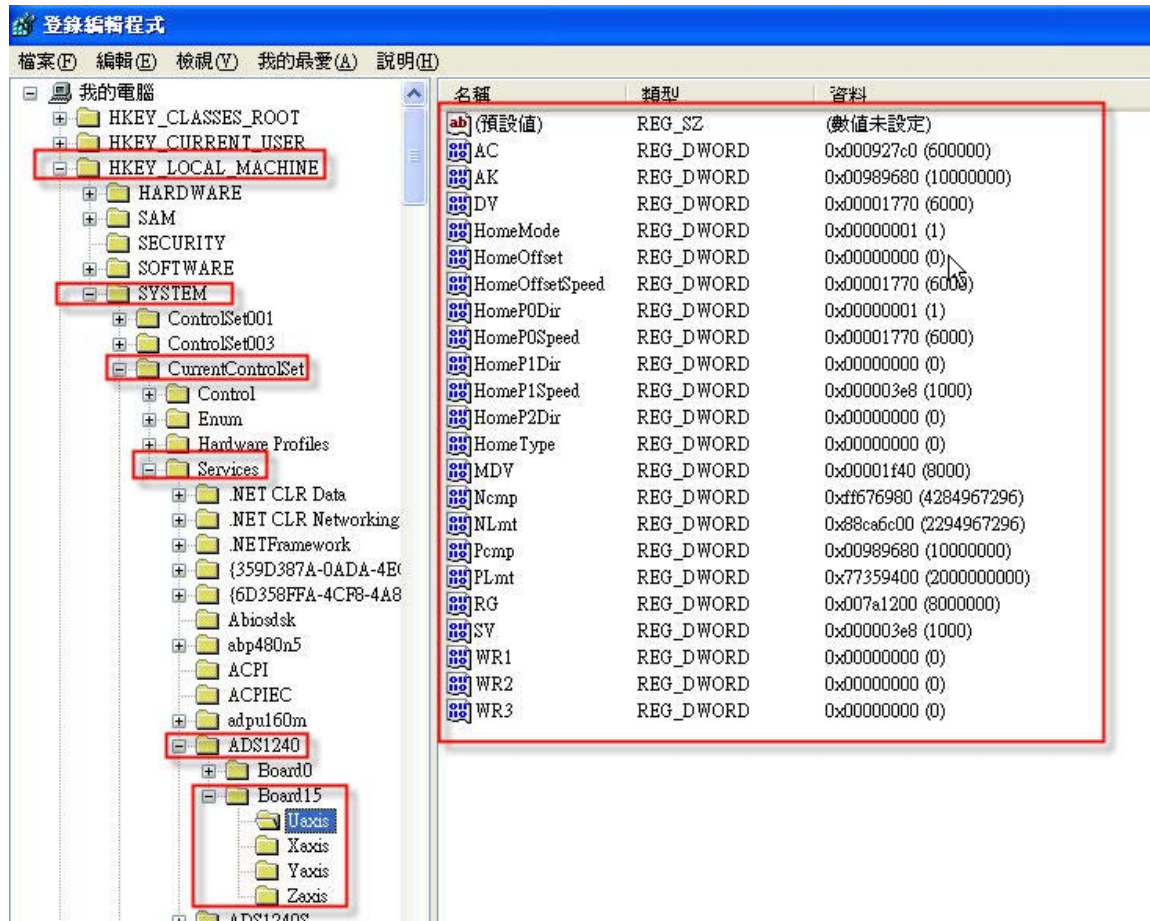
Load Import

Save Parameters to:
☐ Axis X ☐ Axis Z
☐ Axis Y ☐ Axis U

Save Export Reset Exit

Utility Operation

- All the settings will be saved to registry



Utility Operation

- Check IO by clicking “Input Status” button

Input Status

All input signals can be checked

IN0/Z is for encoder index

IN3/H is for ORG(Home)

Input Status													
	LMT+	SLMT+	IN1	IN2	IN3/H	SLMT-	LMT-	IN0/Z	ALM	INPOS	DRV	ERR	CNST
X	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Y	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Z	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Utility Operation

- Check IO by clicking “Input Status” button
OUT4~7 can be controlled
OUT6 is for ServoON

Input Status

OUT4 ~ OUT7 Control and Status

	O4 / >=	O5 / <	O6 / AC	O7 / DC	OUT4	OUT5	OUT6	OUT7
X	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Y	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The latest ending status of a moving can be checked

Drive End Status

	IN	LMT+	LMT-ALM	EMG
X	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Y	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Z	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Utility Operation

- Check IO by clicking “Input Status” button
Real counter (encoder feedback) & logical counter (command counter) can be checked

Position Counter and Compare Register Status

	Real Counter	Logical Counter	Error	COMP+ Reg.	COMP- Reg.
X	0	0	0	0	0
Y	0	0	0	0	0
Z	0	0	0	0	0
U	0	0	0	0	0

EMG IN

Edit

Exit

The counter values can also be edit by clicking “Edit” and then clicking “Update”

Utility Operation

Operation

- Motion control can be done by clicking “Operation”
P-to-P, continuous drive, line interpolation and arc interpolation can be operated

PCI-1240 Motion Utility - Operation - Board 0

Operation Axis

☒ X Axis ☐ Z Axis
☐ Y Axis ☐ U Axis

Drive Mode

☐ Home
☐ Continue Drive
☒ Point to Point Drive
☐ Line Profile Drive
☐ Arc Profile Drive

Movement Mode

☐ Absolute Mode
☒ Relative Mode

Stopping Mode

☒ Slowdown Stop
☐ Immediate Stop

Continue and Point to Point Drive Parameters Setting

	Drive Speed	End Position	Continue Drive Dir.
X	8000	1000	CW
Y	8000	0	CW
Z	8000	0	CW
U	8000	0	CW

Line and Arc Drive Parameters Setting

Line / Arc Speed :		Line End :	Arc Center Position :
SV :	1000	X : 6000	C1 : 3000
DV :	3000	Y : 6000	C2 : 3000
AC :	10000	Z : 6000	Arc End Position :
AK :	10000	U : 6000	E1 : 6000
			E2 : 6000

Acceleration Mode

☒ T Curve Mode
☐ S Curve Mode

Arc Direction

☒ CW Direction ☐ Angle
☐ CCW Direction

External Mode

Mode Selected
Disable

H/W Pulses Set
100

Set

Start

Change DV

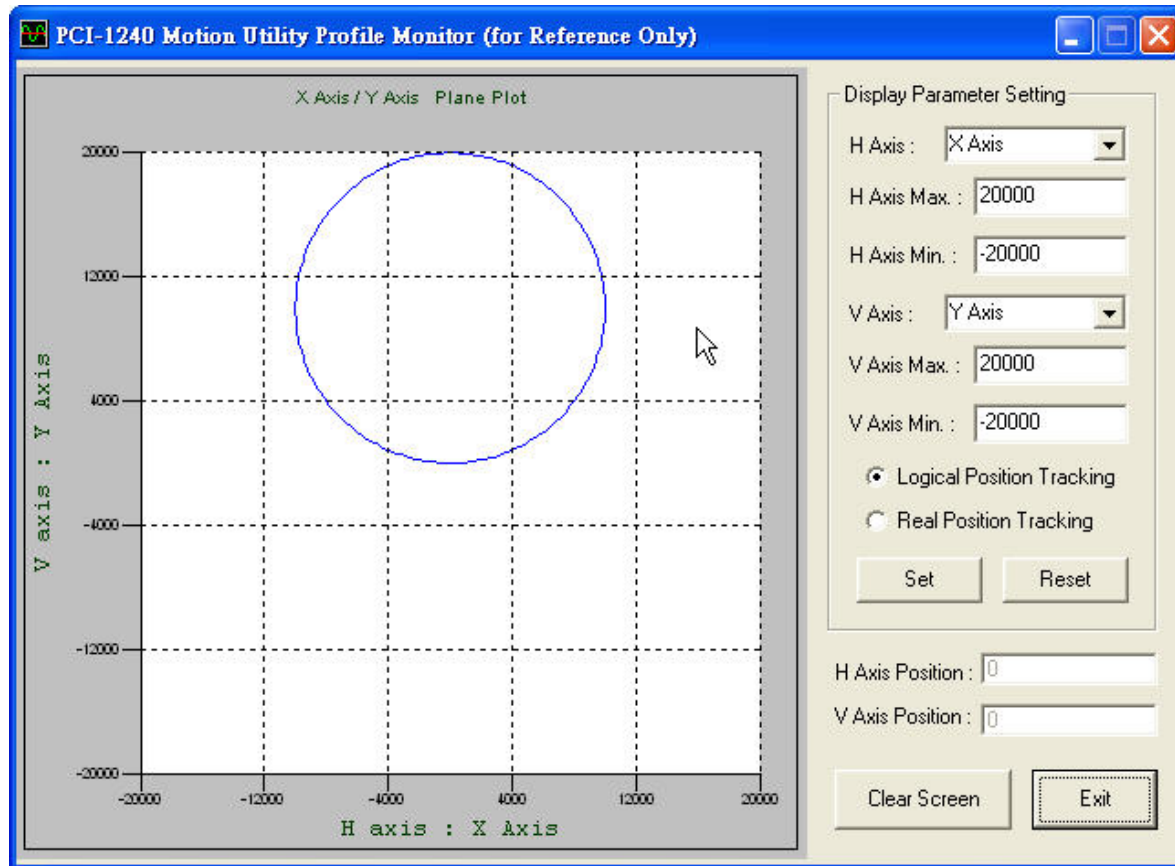
Stop

Exit

Utility Operation

- Motion can be plotted by clicking “Profile Monitor”
Any 2 axis can be selected to be traced

Profile Monitor

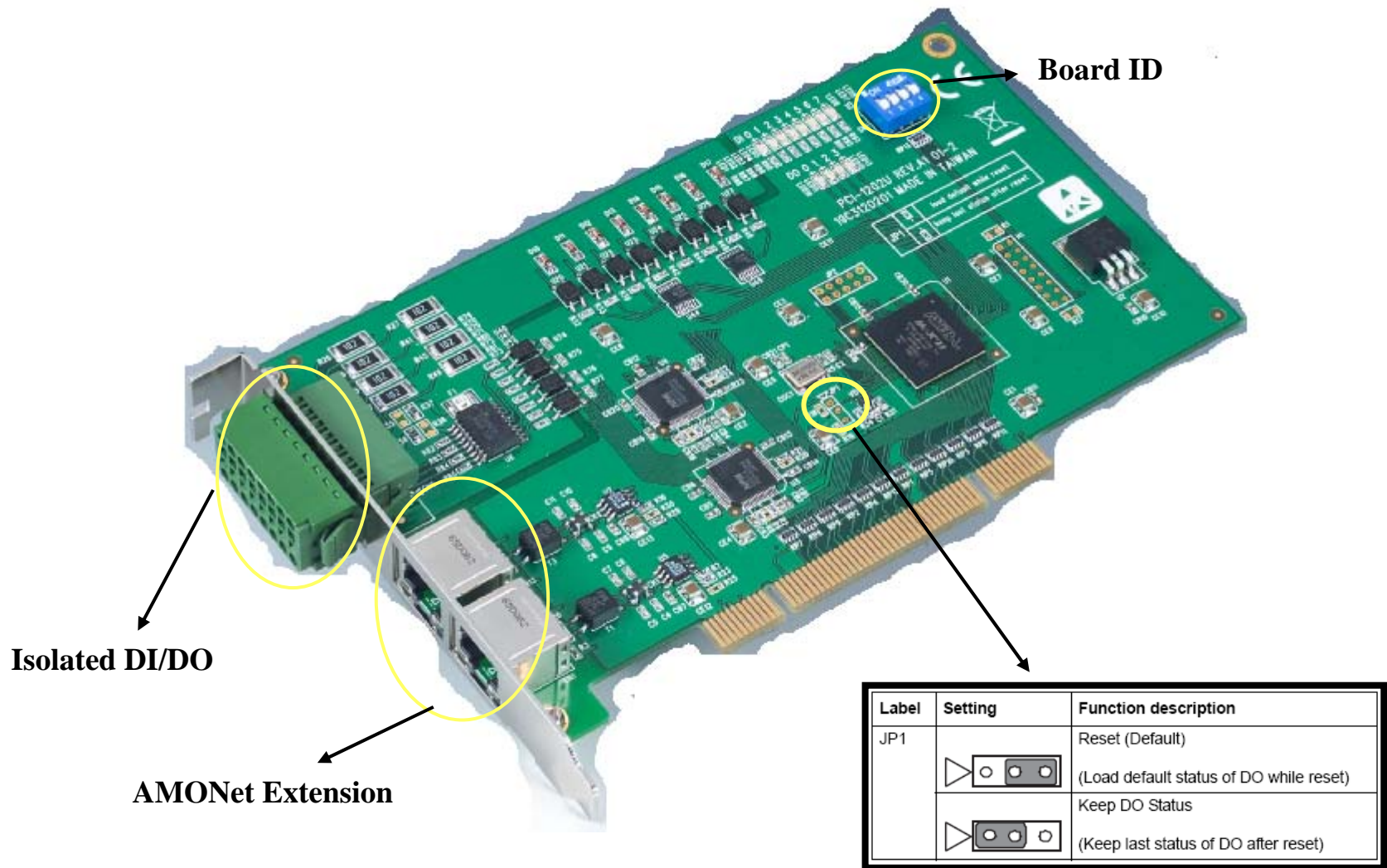


Installation & Testing of PCI-1202U

Driver installation

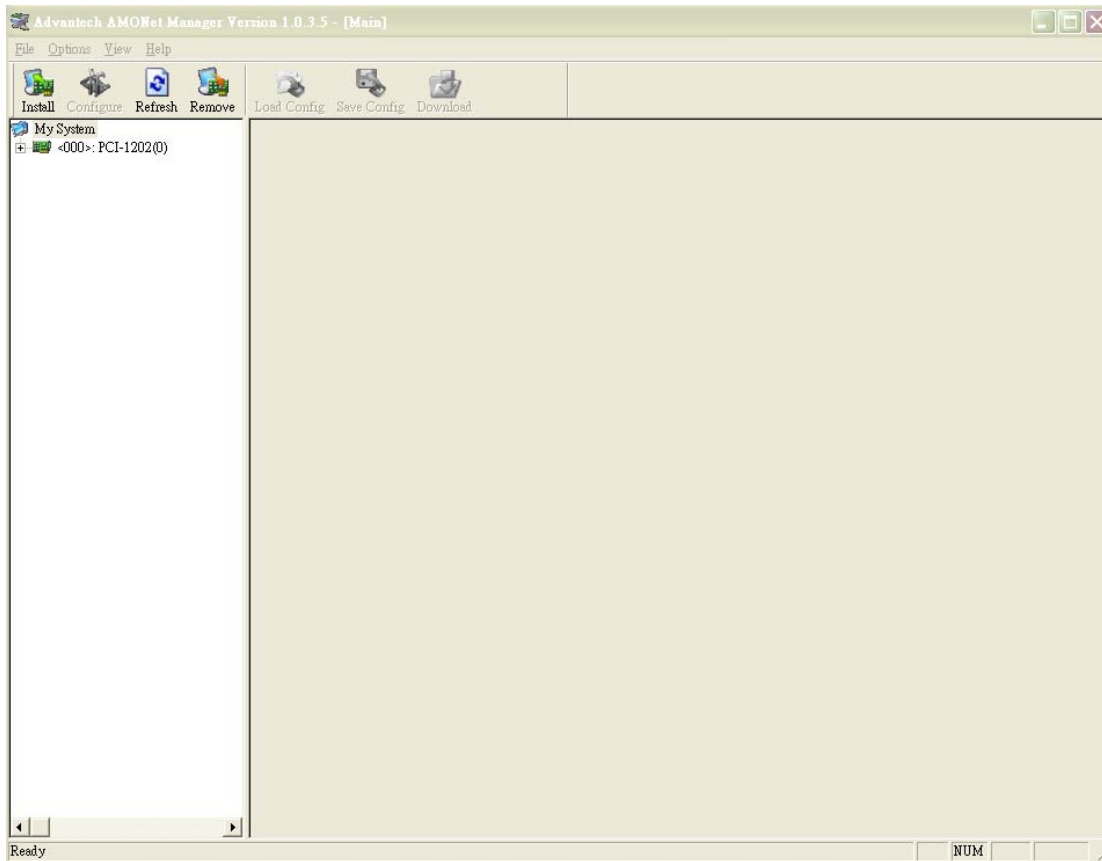
- **Driver:** AMONetDriver.exe
Source: Companion CD\Drivers\PCI\1240.exe
Website: http://support.advantech.com.tw/support/DownloadSRDetail.aspx?SR_ID=1-1W8JTJ
- **After the installation, the software manual can be found in** C:\Program Files\Advantech\AMONet\AMONet.chm
- **VB, VC, BCB, C#, VB.NET examples are given at** C:\Program Files\Advantech\AMONet\Example

Locations of Jumpers and DIP SWs



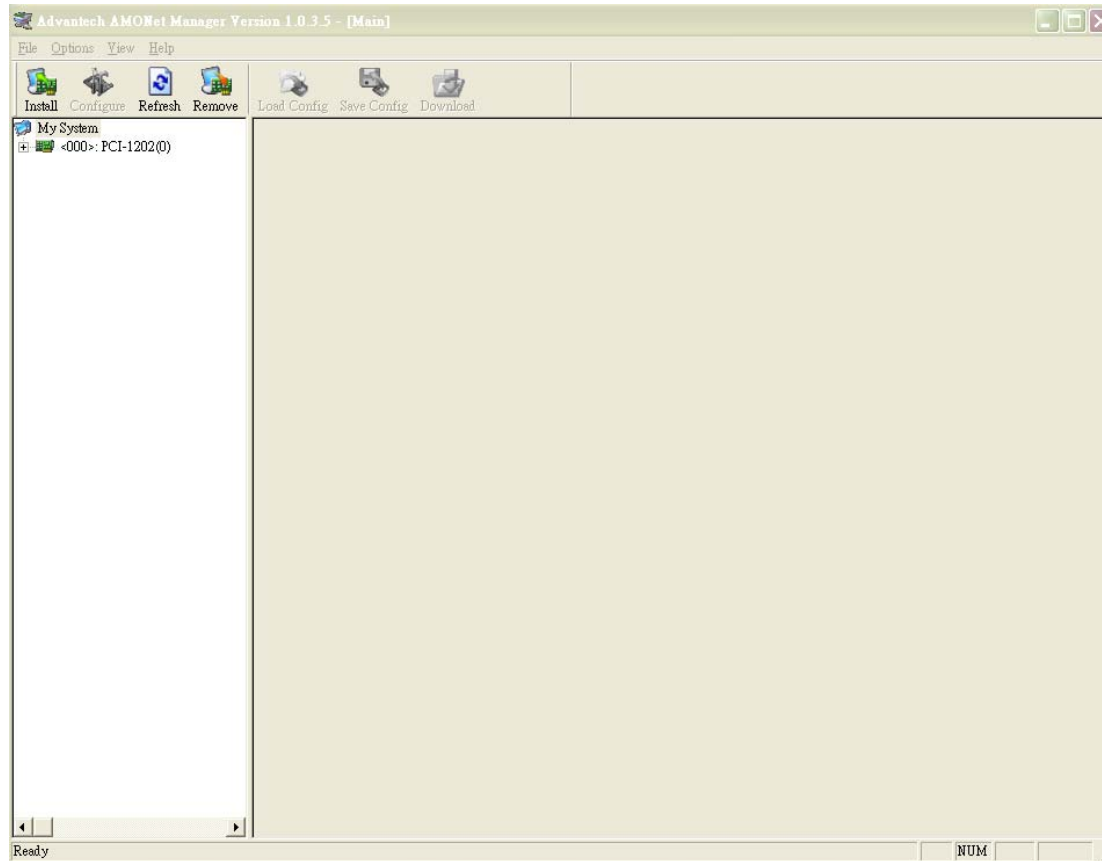
Utility Operation

- Start Menu → Programs → AMONet Device Manager → AMONet Device Manager



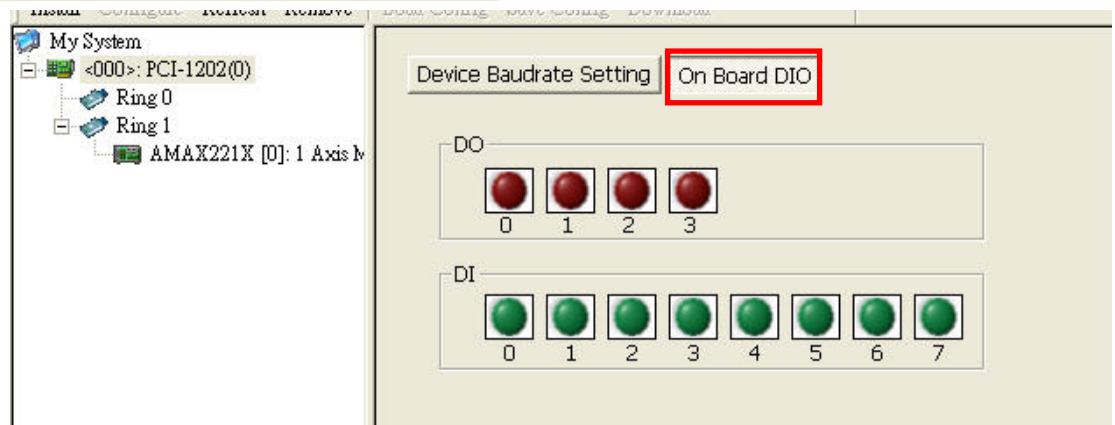
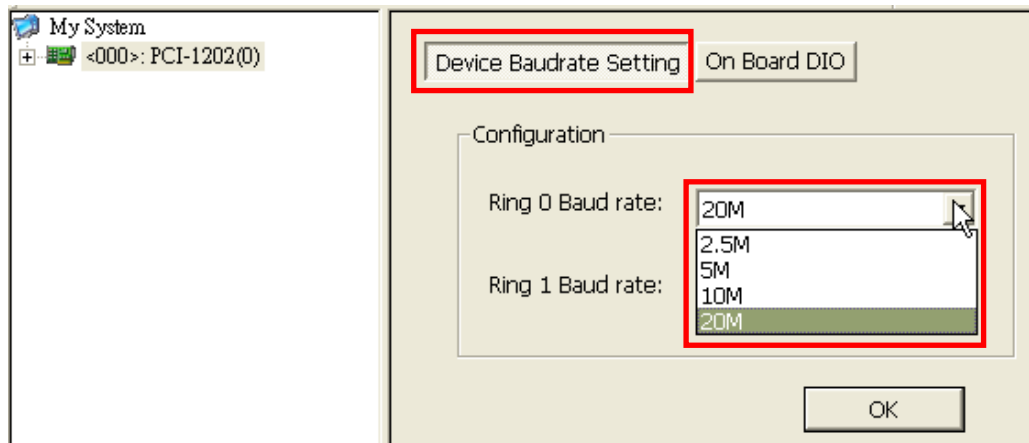
Utility Operation

- Click  button first



Utility Operation

- Select PCI-1202U, then you'll see the Baudrate setting and on-board DIO control



Utility Operation

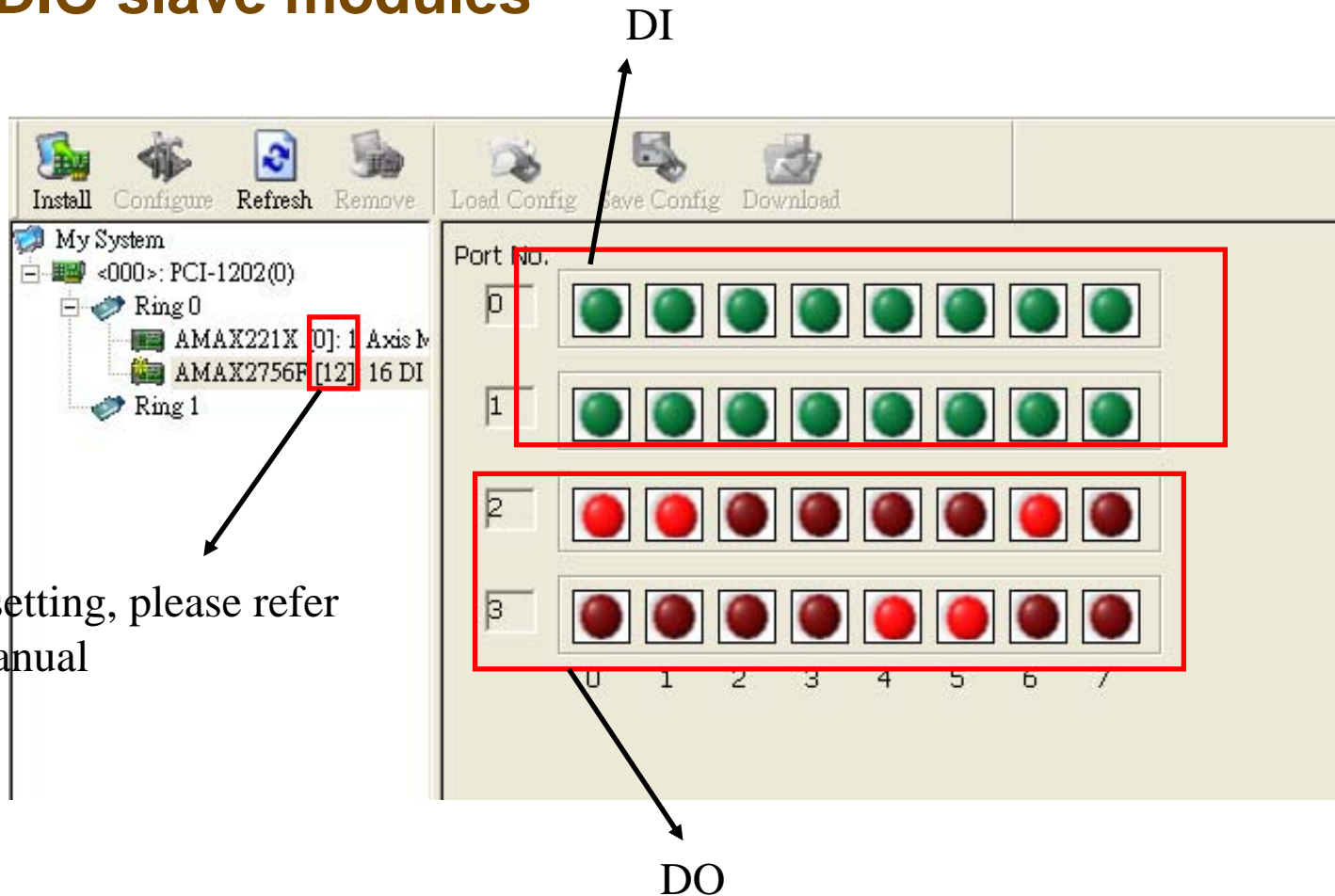
- Click “+” button to see slave modules that are connected to PCI-1202

Up to 64 modules per ring

The screenshot displays the ADVANTECH eAutomation software interface. On the left, the 'My System' tree shows a hierarchy: 'My System' -> '<000>: PCI-1202(0)' -> 'Ring 0' (highlighted with a red box). Under 'Ring 0', two modules are listed: 'AMAX221X [0]: 1 Axis M' and 'AMAX2756F [12]: 16 DI'. An arrow points from the text 'Up to 64 modules per ring' to the 'Ring 0' box. The main control panel on the right contains sections for 'Velocity Profile' (with fields for Distance, Start Vel., Max Vel., Acc., Dec., SAcc Range, and SDec Range), 'Configuration' (with Home, Motion, and Pulse buttons), 'Motion Test' (with navigation and Stop buttons, and SVON, RALM, and ERC buttons), 'Position' (with Command, Feedback, and Error Counter fields, and a Reset button), and a 'Status' column with 16 indicator lights. The bottom status bar shows 'Motor is stopped.' and '0.00'.

Utility Operation

- Test of DIO slave modules



About BoardID setting, please refer
AMAX series manual

Utility Operation

- Test of motion 1-axis slave modules

Velocity Profile

Distance: pulse

Start Vel.: pps

Max Vel.: pps

Acc.: sec

Dec.: sec

SAcc Range: pps

SDec Range: pps

Speed Pattern

☒ Trapezia ☐ S-Curve

Move Mode

☐ P to P ☒ Continue ☐ Homing

Set Parameters Display Profile

Configuration

Home Motion

Pulse

Motion Test

<--- Stop --->

SVON RALM ERC

Position

Command:

Feedback:

Error Counter:

Reset

Status

RDY ☐

ALM ☐

+EL ☐

-EL ☐

ORG ☒

DIR ☐

EMG ☐

PCS ☒

ERC ☐

EZ ☐

CLR ☒

LTC ☒

SD ☒

INP ☒

SVON ☐

RALM ☐

Motor is stopped. 0.00

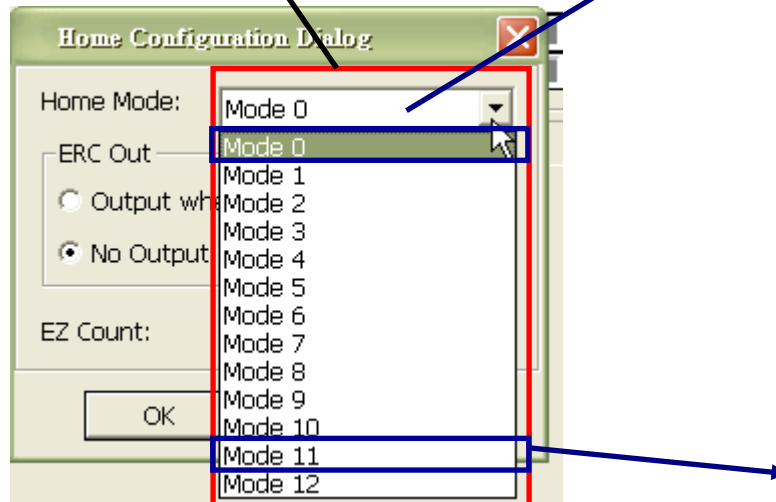
reset position value

Utility Operation

■ Home mode setting

Home

Please refer the software manual

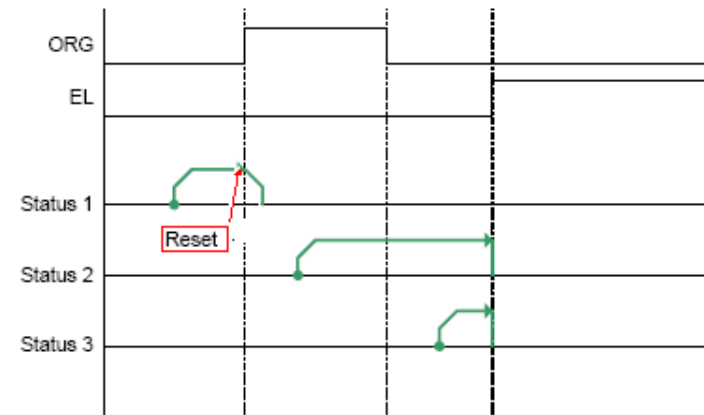


ORG->Slow down->Go back (backward)->Accelerate to MaxVel->EZ->Slow down->Go back again (forward)->Stop at beginning edge of EZ

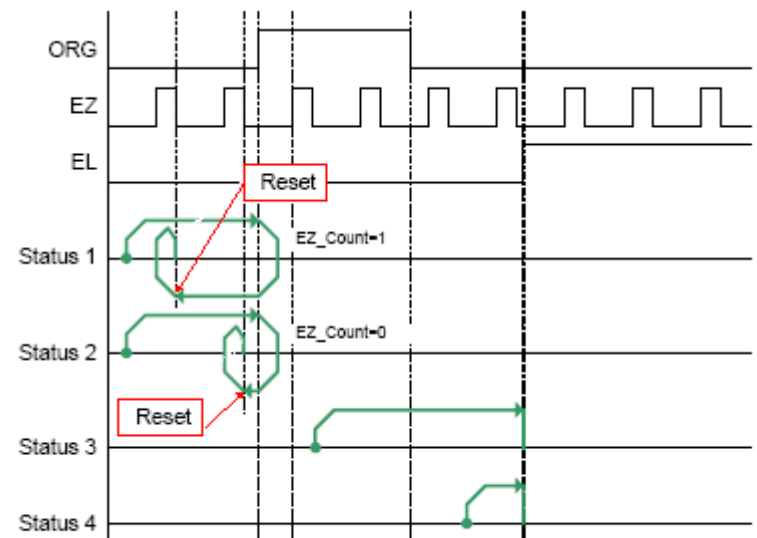
home_mode=0

ORG->Slow down->Stop

When SD(Ramp-down signal) is inactive



home_mode=0 When SD(Ramp-down signal) is inactive



home_mode=11

Utility Operation

- Motion IO setting

Motion

Motion Configuration Dialog

Servo Motor Signal | Mech Signal

ALM Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	Response Mode <input checked="" type="radio"/> Stop Immed. <input type="radio"/> Dec. to Stop	ERC Output <input checked="" type="radio"/> No ERC Output <input type="radio"/> ERC Output
INP En/Disable <input type="radio"/> Enable <input checked="" type="radio"/> Disable	Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	ERC Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active
ERC Active Time <input checked="" type="radio"/> 12us <input type="radio"/> 409us <input type="radio"/> 13ms <input type="radio"/> 104ms <input type="radio"/> 102us <input type="radio"/> 1.6ms <input type="radio"/> 52ms <input type="radio"/> Level		ERC No Active Time <input checked="" type="radio"/> 0us <input type="radio"/> 1.6ms <input type="radio"/> 12us <input type="radio"/> 104ms

OK Cancel

Motion Configuration Dialog

Servo Motor Signal | Mech Signal

EL Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	Response Mode <input checked="" type="radio"/> Stop Immed.. <input type="radio"/> Dec. to Stop	ORG Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active
EZ Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	LTC Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	SD En/Disable <input type="radio"/> Enable SD <input checked="" type="radio"/> Disable SD
SD SD Latch <input type="radio"/> Enable LTC <input checked="" type="radio"/> Disable LTC	Logic <input checked="" type="radio"/> Low Active <input type="radio"/> High Active	Response Mode <input checked="" type="radio"/> Slow Down <input type="radio"/> Dec. to Stop

OK Cancel

Utility Operation

- Pulse output and input (encoder) setting

Pulse

Pulse I/O Configuration Dialog

Output Pulse | **Input Pulse**

Pulse Output Mode

- ☒ OUT/DIR-OUT is falling edge, DIR+ is High level
- ☐ OUT/DIR-OUT is rising edge, DIR+ is High level
- ☐ OUT/DIR-OUT is falling edge, DIR+ is Low level
- ☐ OUT/DIR-OUT is rising edge, DIR+ is Low level
- ☐ CW/CCW Falling edge
- ☐ AB Phase, A lag
- ☐ AB Phase, B lag
- ☐ CW/CCW Rising edge

OK Cancel

Pulse I/O Configuration Dialog

Output Pulse | **Input Pulse**

Source

- ☒ Encoder(External)
- ☐ Pulse Output(Internal)

Logic

- ☒ Don't inverse
- ☐ Inverse Dir.

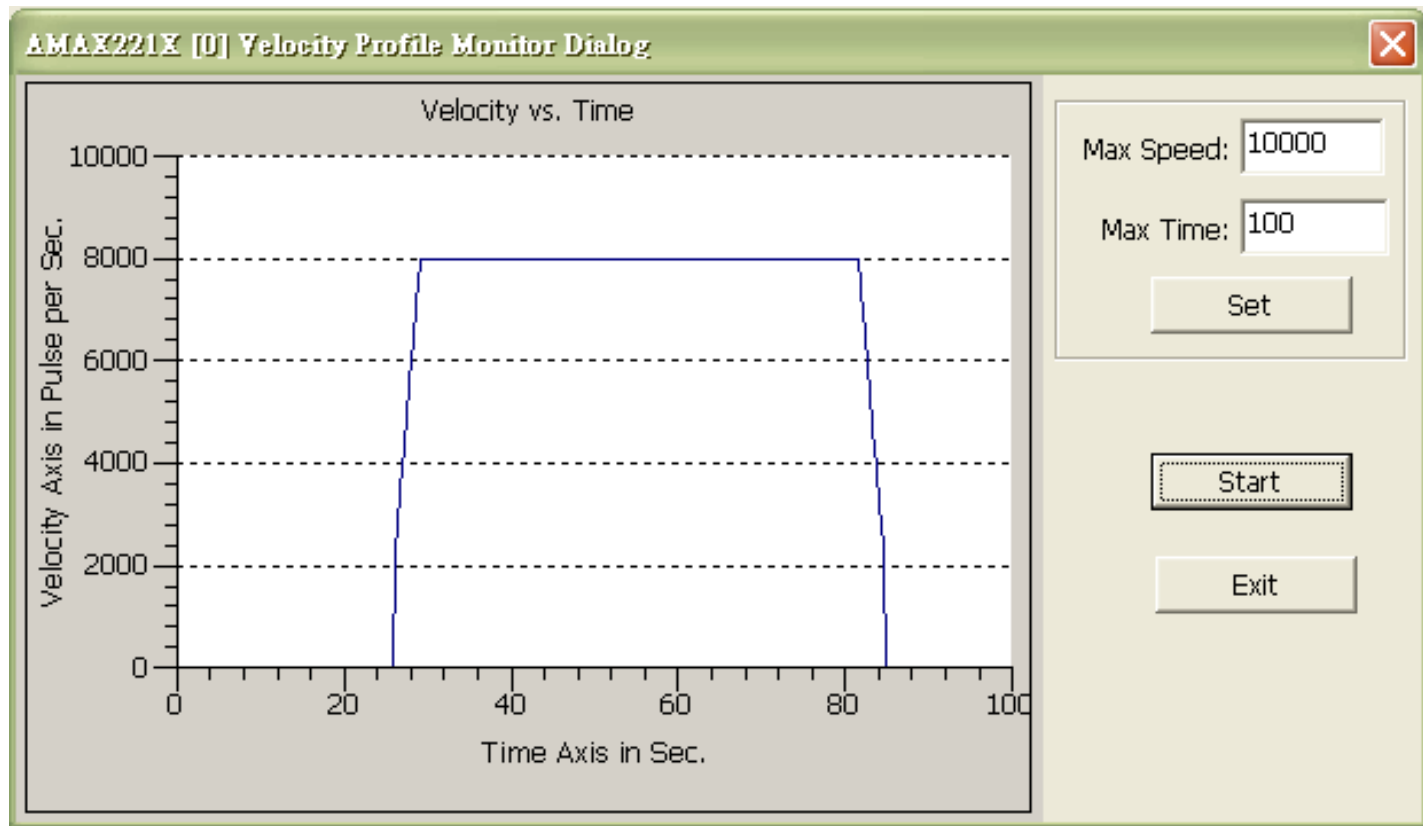
Mode

- ☒ 1X AB Phase
- ☐ 2X AB Phase
- ☐ 4X AB Phase
- ☐ CW/CCW

OK Cancel

Utility Operation

- Velocity profile can be checked



The End & Thank you.